The opinion in support of the decision being entered today is *not* binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Ex parte SAMUEL C. WEAVER

Appeal 2007-0612
Application 09/838,866
Technology Center 3600

Decided: August 27, 2007

Before TERRY J. OWENS, HUBERT C. LORIN, and JOSEPH A. FISCHETTI, *Administrative Patent Judges*.

TERRY J. OWENS, *Administrative Patent Judge*.

DECISION ON APPEAL

The Appellant appeals from a rejection of claims 1-14.[1]

---

[1] In the Appeal Brief (Br. 2) the Appellant withdrew the appeal as to claims 15 and 16.

THE INVENTION

The Appellant claims a horseshoe made of a specified metal matrix composite. Claim 1 is illustrative:

> 1. A metal matrix composite horseshoe having improved vibration damping and stiffness, said horseshoe comprising a metal matrix composite that is formed from a molten metal selected from the group consisting of aluminum, magnesium, titanium and mixtures thereof, and from particles of silicon hexaboride and mixtures thereof, said silicon boride composition being present in a range from about 0.1 to about 80 weight percent in said molten metal.

THE REFERENCES

Eom	US 5,344,608	Sep. 6, 1994
Weaver	US 5,573,607	Nov. 12, 1996

THE REJECTION

Claims 1-14 stand rejected under 35 U.S.C. § 103 as being unpatentable over Eom in view of Weaver.

OPINION

We reverse the aforementioned rejection and remand the application to the Examiner.

Eom discloses a race horse horseshoe comprised of a metal alloy made by mixing, by weight, 0.5-0.10% Si, 0.05-0.1% Fe, 0.10-0.20 % Cu, 0.10-0.20% Mn, 3.00-5.00% Mg, 0.05-0.15% Cr, 0.05-0.10% Zn, and 96.6-94.15% Al (col. 1,

ll. 56-61; col. 4, ll. 7-14). Eom teaches that "the horseshoe must be excellent in abrasion resistance and shock absorption and ductile enough to change its shape a little so as to suit the diverse sizes and forms of the hooves at the Lime [sic, time] of fitting on the hoof" (col. 1, ll. 27-31). Eom discloses that the alloy is abundant in ductility and, therefore, easily fitted on the hoof (col. 3, ll. 8-10).

Weaver discloses a metal matrix composite formed from a molten metal selected from the group consisting of aluminum, magnesium, titanium and mixtures thereof, and particles of a silicon boride composition selected from the group consisting of silicon tetraboride and silicon hexaboride, the silicon boride composition being present in a range of about 0.1 to about 80 wt% in the metal (col. 3, ll. 14-20). Weaver teaches (col. 1, ll. 19-25):

> The light weight metals of aluminum and magnesium have very large markets for they are utilized in a wide variety of industries. In a lesser way, titanium is also utilized as a light weight fabrication metal. These metals suffer from some drawbacks, however, which limit their usefulness. These include low stiffness (low modulus of elasticity), high thermal coefficient of expansion, and low strength.

Weaver discloses that his silicon boride composition is a strengthening agent (col. 1, ll. 53-55; col. 2, ll. 3-10) and that his metal matrix composite has "desired modulus of elasticity, coefficient of expansion and strength" (col. 2, ll. 14-15). The Appellant acknowledges that Weaver's metal matrix composite is the metal matrix composite from which the Appellant's horseshoe is made (Spec. 2:13-15).

The Examiner states that "the Examiner believes the [Appellant's] metal matrix composite is defined as a material being formed by molten metal selected from of [sic] aluminum, magnesium, titanium and mixtures thereof" (Answer 4). The Examiner is incorrect. As set forth in the Appellant's independent claims (1 and 9) the metal matrix composite has a component in addition to the molten metal, i.e., particles of silicon boride composition.

The Examiner argues that "it would have been obvious to combine Eom with Weaver for a teaching of silicon boride composition to make the metal material stronger in the horseshoe of Eom" (Answer 5). Eom, however, desires abundant ductility to permit the horseshoe to be shaped to fit diverse hoof sizes (col. 1, ll. 27-31; col. 3, ll. 7-10). The Appellant's claims require as little as about 0.1 wt% silicon boride composition. The Examiner, however, has not provided evidence or technical reasoning which shows that there is any amount of silicon boride composition, whether about 0.1 wt% or more, that will increase the strength of Eom's metal alloy without taking away the desired ductility.

Hence, the Examiner has not established a prima facie case of obviousness of the Appellant's claimed invention over the combined disclosures of Eom and Weaver.

Remand

We remand the application to the Examiner for the Examiner to consider rejecting the Appellant's claims under 35 U.S.C. § 103 over the Appellant's admitted prior art in view of Weaver.

The Appellant acknowledges (Spec. 1:14-19):

> In the past light weight shoes have usually been formed by making a shoe out of a light metal, usually aluminum with steel inserts or calks placed at the points of expected wear. Such shoes, however, have been found to have both poor wear and poor strength characteristics. Generally, use of lightweight metals without inserts in horseshoes has been found to produce the same type of problems: rapid wear and severely reduced strength when compared to the standard steel or iron horseshoes.

The Appellant does not indicate that Eom's horseshoe ductility was desired in the Appellant's acknowledged prior art.

Weaver teaches that adding the disclosed silicon boride composition as a strengthening agent to molten aluminum, magnesium, titanium and their alloys, thereby forming a metal matrix composite from what otherwise would be a molten metal composition, has the benefit of increasing stiffness, lowering the coefficient of thermal expansion, and increasing strength (col. 1, ll. 22-25, 53-57; col. 2, ll. 3-10, 15-16).

The Examiner should consider whether one of ordinary skill in the art, through the use of no more than ordinary creativity, would have added Weaver's silicon boride composition strengthening agent to the prior art horseshoe lightweight metal, thereby forming a metal matrix composite, to provide the horseshoe with the desired increased strength (Spec. 1:17-19). *See KSR Int'l. Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1741, 82 USPQ2d 1385, 1396 (2007) (In making an obviousness determination one "can take account of the inferences and creative

steps that a person of ordinary skill in the art would employ."). As disclosed by Weaver (col. 1, l. 24; col. 2, ll. 14-15), that composite also would have the improved stiffness recited in the Appellant's independent claims (1 and 9).

As for the improved vibration damping recited in the Appellant's independent claims, references need not be combined for the purpose of solving the problem solved by the Appellant. *See KSR*, 127 S.Ct. at 1742, 82 USPQ2d at 1397 ("[T]he problem motivating the patentee may be only one of many addressed by the patent's subject matter. The question is not whether the combination was obvious to the patentee but whether the combination was obvious to a person with ordinary skill in the art."); *In re Kemps*, 97 F.3d 1427, 1430, 40 USPQ2d 1309, 1311 (Fed. Cir. 1996); *In re Beattie*, 974 F.2d 1309, 1312, 24 USPQ2d 1040, 1042 (Fed. Cir. 1992); *In re Dillon*, 919 F.2d 688, 693, 16 USPQ2d 1897, 1901 (Fed. Cir. 1990) (en banc), *cert. denied*, 500 U.S. 904 (1991). Adding Weaver's silicon boride composition strengthening agent to the prior art lightweight metal to strengthen it would have been a reason sufficient for establishing a prima facie case of obviousness.

In a declaration (dated January 13, 2003), Weaver (the Appellant) states:

> The test results determined that vibration damping in the aluminum matrix composite was 4.25 times greater than vibration damping in aluminum. [¶ 15]
>
> * * *

> Based on my education and experience in the field of metallurgy, prior to the time of the above-mentioned tests, the vibration dampening property of the aluminum matrix composite was unknown and the relatively high vibration damping of that metal matrix composite was unexpected.[2] [¶ 16]

Weaver's declaration statements regarding unexpected results are directed toward the metal matrix composite itself and, therefore, may be relevant to the patentability of the metal matrix composite over the prior art. The Appellant, however, is not claiming the metal matrix composite but, rather, is claiming a horseshoe, and the Appellant has not shown unexpected results of a horseshoe versus other objects fabricated from the metal matrix composite. Moreover, Weaver's argument regarding unexpected results is deficient in that there is no supporting evidence, let alone evidence that is commensurate in scope with the claims, the broadest of which encompasses molten metals selected from aluminum, magnesium, titanium and mixtures thereof, silicon boride compositions selected from silicon tetraboride, silicon hexaboride and mixtures thereof, and amounts of silicon boride composition ranging from about 0.1 wt% to about 80 wt%. *See In re Grasselli*, 713 F.2d 731, 743, 218 USPQ 769, 778 (Fed. Cir. 1983); *In re Clemens*, 622 F.2d 1029, 1035, 206 USPQ 289, 296 (CCPA 1980). *See In re Baxter Travenol Labs.*, 952 F.2d 388, 392, 21 USPQ2d 1281, 1285 (Fed. Cir. 1991); *In re De Blauwe*, 736 F.2d 699, 705, 222 USPQ 191, 196 (Fed. Cir. 1984).

---

[2] The Appellant should clarify whether the vibration property was still unknown as of the Appellant's invention date.

We further remand the application for the Examiner to consider whether "improved vibration damping and stiffness" in the Appellant's independent claims is indefinite under 35 U.S.C. § 112, second paragraph, due to failure of the claim to indicate with respect to what the vibration damping and stiffness are improved.

DECISION

The rejection of claims 1-14 under 35 U.S.C. § 103 over Eom in view of Weaver is reversed. The application is remanded to the Examiner.

REVERSED and REMANDED

jlb

COHEN & GRIGSBY, P.C.
11 STANWIX STREET
15TH FLOOR
PITTSBURGH PA 15222